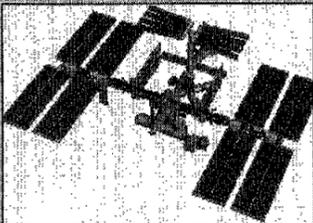


In this issue



Clip and save the complete International Space Station assembly sequence.

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Boy scouts brave the rain for a camp out at JSC's pecan grove.

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Moody Gardens adds a new pyramid with the help of JSC workers.

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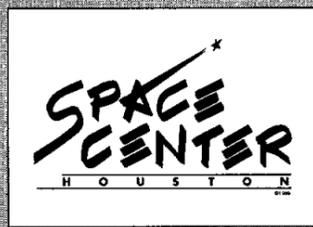
Twenty-four years ago, astronauts make the first trip to a space station.

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Now is the time to apply for astronaut candidate school.

Page 7



Robot Zoo is set to open and summer camps are now taking reservations.

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Station board approves new schedule

By James Hartsfield

The International Space Station Control Board has approved a new baseline schedule that keeps the assembly sequence intact and targets the first station launch for June 1998—an eight-month delay from the previous schedule.

As announced by NASA in April, the revision in the station's assembly schedule is the direct result of funding delays in the construction of the Service Module, the primary Russian contribution to the early assembly of the station and a component that will supply the early living

quarters, life support systems and propulsion. Russian-funded work on the Service Module now has fully resumed as a result of Russian government funding, and it is rapidly progressing.

"The recent completion of a major Russian general designers review for the Service Module, in which I participated, and full Russian funding of the work, gives us high confidence that the Service Module can meet a revised launch date of December 1998," Program Manager Randy Brinkley said. "The Russian Space Agency has been

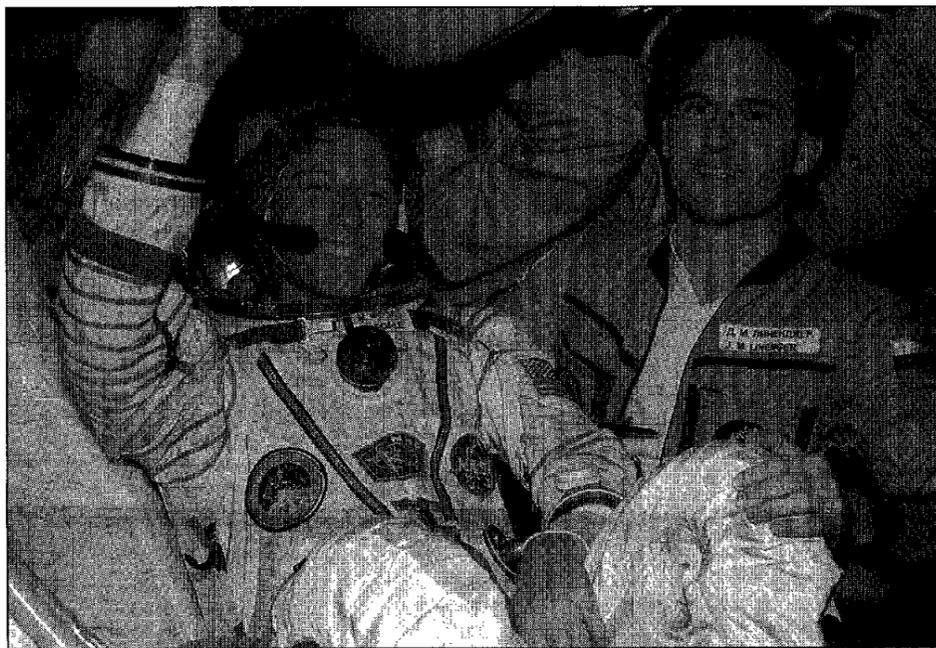
extremely forthcoming in its dealings with NASA on this subject, and they and their contractors have gone out of their way to demonstrate their resolve to meet their commitment. Based on what I saw and heard during my most recent visit to Russia, I have every confidence that the RSA and the Russian space industry are fully committed to meeting their obligations for the Service Module and ISS."

Although the first station launch, that of the Functional Energy Block on a Russian Proton booster, is

delayed by eight months in the new schedule, the beginning of full-fledged research flights to the station in August 1999—the end of Phase 2 of the program—is a delay of only four months from what previously had been planned. To enhance the station's capabilities, modifications will be made to the Functional Energy Block to allow it to be refueled and to accommodate dockings by Russian Soyuz capsules.

Despite delays in the Russian hardware, work has continued on all U.S. station components, and the

Please see **NEW**, Page 2



NASA Photo S84E5049

Having completed the donning of his Sokol space suit—his first duty as a cosmonaut researcher for Mir-23—Mike Foale, left, poses with Jerry Linenger onboard Mir's base block. Foale's checkout in the Russian suit was one of several activities that marked his transition from STS-84 to Mir 23 crew member. He relieves Linenger, who has been on Mir since the middle of January, and will extend the continuous American presence on the Russian station until Wendy Lawrence arrives in September.

Survey findings highlight space program's impact

A national survey released recently by the Council for Excellence in Government highlights the importance of space to the public, said NASA Administrator Daniel S. Goldin.

The survey, conducted for the council by the research firms of Peter D. Hart and Robert M. Teeter, indicates that "promoting space exploration" is the only one of 16 tested items about which a plurality of Americans say the federal government has been very successful.

"This survey demonstrates again the importance Americans place on exploration and discovery," Goldin said, "and their belief that one of the most important roles of the federal government is to help push back the boundaries of knowledge. NASA is not only a crucial investment in our national future—it is also a tangible symbol to the American peo-

ple of the greatness to which we aspire.

"We are gratified to learn from this survey that NASA has been successful in meeting the needs of the American public," Goldin said. "In recent years, we have redoubled our efforts to be responsive to the public and to describe, in meaningful terms, the value and relevance of space exploration.

"NASA's original charter mandates that the agency widely disseminate the results of its activities. Our philosophy is one of openness, of sharing the triumphs and set-backs of our cutting-edge research," Goldin said. "As a result, the public has shared these experiences and many feel a sense of direct ownership or involvement in NASA's programs. This is how it should be—NASA's programs are, indeed, their programs."

Linenger hands off Mir baton

Astronaut Mike Foale is settling in as the newest American flight engineer aboard the Russian Mir Space Station after a successful docking of the Space Shuttle *Atlantis*.

Foale officially relieved colleague Jerry Linenger on May 18; it was Linenger's 123rd day on orbit.

"Your NASA 5 crew member would like to report that he has fully switched over to the Mir side," Foale told Mission Control, Houston. "We have done a successful check of my space suit and the Soyuz and, most important, the food is getting ready in the base block and I guess my sleeping bag's hanging on the wall in Spektr. So I'd like to report that I have exchanged places with Jerry and I'm looking forward to my stay here."

"I stand relieved of duties on the Mir," Linenger acknowledged. "It's good to be back on U.S. soil and joining Charlie Precourt's crew, and looking forward to seeing you all back in Houston. Thanks to everybody for all the support over the last four or five months."

Linenger briefed Foale about conditions on board the Russian outpost, showing him where things are located, and bringing Foale up to speed on scientific experiments. Foale will serve aboard the Russian facility for four and a half months until he is replaced by Wendy Lawrence when *Atlantis* again docks with Mir in September.

In addition to the exchange of human cargoes, the shuttle and Mir crews also transferred a new oxygen generating system for the Mir and loaded the old unit onto *Atlantis* for return to Earth. The new Elektron will be installed in Mir's Kvant-1 module after *Atlantis* undocks and used as a backup to the existing Elektron unit in the Kvant-2 module.

The rest of the cargo transfer also went well as the two crews moved more than 3 tons of food, fuel, clothing and other supplies between the two spacecraft.

The other space travelers performed a variety of science experiments. Commander Charlie Precourt and Pilot Eileen Collins set up equipment to take environmental air samples and cosmic radiation measurements. Mission Specialist Jean-François Clervoy

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Texas Legislature honors space, technology

Twenty-six years after President Kennedy challenged America to put a man on the Moon, the 75th Texas Legislature will be asked to dedicate the last week of May to NASA and its technological accomplishments.

On Wednesday, May 28, Rep. Bill Carter, R-Ft. Worth, will introduce into the House of Representatives a resolution proclaiming the week of May 25-31 Texas Space and Technology Week.

"It is my great honor and privilege to be part of a group of Texans who witnessed the spec-

taclular launch of the Hubble Space Telescope servicing mission," Carter said. "It had to be the most exciting sight I have ever witnessed. I was more impressed with the professionalism and the vast networking of engineering skills required for space exploration. The next day I started talking to other people in the Legislature to see if I could get support on promoting 'Texas Space and Technology Week.'"

Carter and his colleagues will recognize NASA, its contractors and

the Clear Lake Economic Development Foundation for their commitment to the advancement of space and technology in Texas.

"We all agreed that we needed to raise the awareness of the most outstanding space program in the world," Carter said. "It also would give us an opportunity to showcase some of the outstanding technology that has been a direct result of our space program."

To celebrate, a special exhibit will be featured during the week in the rotunda of the capitol building. A 20-

foot-long graphic tells the story of human space flight while the opposite side describes the medical benefits of space technology. Both sides use pictorial views to illustrate the progress NASA has made in exploring space and identifying tangible results from technology.

The Technology Transfer and Commercialization Office will complement the 20-foot display with a technology exhibit that uses graphics, photos and actual consumer products developed by commercial entities from space technology.

International Space Station Assembly Sequence

Date	Flight	Launch	Element(s)	Rationale
June 1998	1A/R	Russian	Functional Cargo Block	Provides propulsive control capability, fuel storage and rendezvous and docking capability to Service Module.
July 1998	2A	US	Node 1, Pressurized Mating Adapters	Provides interfaces between US and Russian elements.
Dec 1998	1R	Russian	Service Module	Provides environmental control and life support system functions.
Dec 1998	2A.1	US	Logistics	Adds margin and flexibility to assembly sequence.
Jan 1999	3A	US	Integrated Truss Structure, Pressurized Mating Adapter 3, Ku-band and Control Moment Gyros	Truss allows the temporary installation of the Photovoltaic module for early US-based power, Ku-band communication system supports early science capability, Pressurized Mating Adapter provides a shuttle docking for next flight, and Control Moment Gyros provide non-propulsive attitude control.
Jan 1999	2R	Russian	Soyuz	Permits initial station habitation with three-person crew, providing assured crew return capability.
March 1999	4A	US	Integrated Truss Structure, Photovoltaic module	Establishes initial Photovoltaic module based power capability.
May 1999	5A	US	Lab	Provides initial research capability.
June 1999	6A	US	Ultra High Frequency antenna and Space Station Remote Manipulating System	Antenna provides space-to-space communications capability for space walking, Remote Manipulating System required to perform assembly operations on later flights.
Aug 1999	7A	US	Joint Airlock and High Pressure Gas Assembly system	Airlock provides station-based space walking capability and high pressure gas assembly augments the Service Module gas resupply system.
Oct 1999	7A.1	US	U.S. outfitting	Outfitting prior to beginning utilization flights.
Dec 1999	4R	Russian	Docking Compartment 1	Provides egress, ingress for Russian based space walks and a Soyuz docking port.
Jan 2000	UF-1	US		Payload resupply and/or changeout.
Feb 2000	8A	US	Integrated Truss Structure, Mobile Transporter	Integrated Truss Structure provides attachment and umbilicals between pressurized elements and permanent truss-mounted distributed system/utilities.
Mar 2000	UF-2	US		Payload resupply and/or changeout.
June 2000	9A	US	Integrated Truss Structure, Central Thermal Control System	Delivers the starboard Central Thermal Control System.
July 2000	9A.1	US	Power control with four solar arrays	Delivery of the Russian power/control mast with four solar arrays providing additional Russian power and delivers European Robotic Arm.
Oct 2000	11A	US	Integrated Truss Structure, Central Thermal Control System	Delivers the port Central Thermal Control System
Nov 2000	12A	US	Integrated Truss Structure, Photovoltaic module	Provides additional power.
Dec 2000	3R	Russian	Universal Docking Module	Provides docking locations for Russian Research Modules, Life Support Modules and a second docking compartment for Soyuz vehicles.
Dec 2000	5R	Russia	Docking Compartment 2	Replaces discarded Docking compartment 1.
Mar 2001	13A	US	Integrated Truss Structure, S-Band	provides additional power and S-Band capability
Apr 2001	10A	US	Node 2, Nitrogen tank assembly	Node 2 provides attach locations, establishes the primary docking location for the shuttle.
May 2001	1J/A	US	Integrated Truss Structure, Photovoltaic module	Lab outfitting.
Aug 2001	1J	US	Japanese Experiment Module	Japanese Experiment Module is delivered and activated.
Sept 2001	UF-3	US		Payload resupply and/or changeout.
Jan 2002	UF-4	US	Alpha Magnetic Spectrometer	Alpha Magnetic Spectrometer researches cosmic ray propagation.
Feb 2002	2J/A	US		Lab outfitting.
Feb 2002	9R.1	Russian	Docking and Stowage Module-1	Provides additional on-orbit stowage and a Soyuz docking location.
May 2002	9R.2	Russian	Docking and Stowage Module-2	Provides additional on-orbit stowage and a Soyuz docking location.
May 2002	14A	US	Cupola and Port Rails, Solar Arrays	Cupola provides direct viewing capability for some robotics operations and payload viewing.
June 2002	UF-5	US		Payload resupply and/or changeout
TBD	2E	US		Lab outfitting.
TBD	8R	Russian	Research Module 1	Provides Russian experiments and research facilities.
TBD	16A	US	Habitation	US Habitation module is delivered and activated.
TBD	10R	Russian	Research Module 2	Provides Russian experiments and research facilities.
TBD	17A	US	Habitation outfitting	Increases US Habitation module outfitting, providing basic habitation facilities for 4 US-based crew.
TBD	11R	Russian	Life Support Module 1	Life Support Module provides oxygen regeneration capability and other life support functions.
TBD	12R	Russian	Life Support Module 2	Second Life Support Module provides oxygen regeneration capability and other life support functions.
TBD	18A	US	Crew Return Vehicle	Crew Return Vehicle attached to the station providing a six-person crew return capability.
TBD	19A	US	Habitation outfitting	Completes US Habitation module outfitting.
TBD	15A	US	Photovoltaic module	Fourth US truss-based module completing the major power system elements.
TBD	UF-6	US		Payload resupply and/or changeout.
TBD	UF7	US	Centrifuge	Centrifuge Accommodations Module attached to Node 2 zenith port enhancing user capabilities.
TBD	1E	US	Columbus Orbital Facility	European Space Agency research facility provides additional research capability.

For Franklin Planner use: cut along bottom line. Place holes on right side, fold in half. Start of assembly should be in front.

New space station web site features details on assembly sequence

(Continued from Page 1)

first U.S.-built component, Node 1, will be delivered to the Kennedy Space Center this summer for pre-launch testing and processing. Node 1 will be launched on STS-88 in July 1998 to be mated to the already-orbiting Functional Energy Block. Because U.S. components such as the laboratory module, the first truss segment and the first solar array remain on schedule, NASA will take advantage of the extra time in assembly to pursue integrated testing of components after they are shipped to Kennedy Space Center.

"A little more than a year from now, we'll launch the first compo-

nent. About a year and a half from now, we will launch the first crew. Only two years from today, that first crew will be finishing up the first tour onboard. Four shuttle assembly flights will already have been completed. And we'll be only a few months from completing Phase 2 of the program," Brinkley said. "This spacecraft is on deck, and we are number one on the runway."

Other highlights of the new schedule, called the International Space Station Assembly Sequence, Rev. C, include:

- In January 1999, the second space shuttle assembly mission, designated STS-92 and assembly

Flight 3A, will be launched and later followed by a Russian Soyuz spacecraft carrying the first crew—International Space Station Commander Bill Shepherd, Soyuz Commander Yuri Gidzenko and Flight Engineer Sergei Krikalev—to begin a permanent human presence on the station.

- Two shuttle flights have been added to the assembly sequence to increase margin and add flexibility. The flights, called flight 2A.1 in late 1998 and flight 7A.1 in late 1999, may be used to offload cargo from adjacent assembly flights and assist with U.S. outfitting of the station.

- At present, NASA plans to continue the conversion of a Naval

Research Laboratory stage into an Interim Control Module, that could be used to augment the station's future propulsion capabilities if needed by being attached to either the Functional Cargo Block or the Service Module.

- Assembly flight 13A, a mission that carries two additional solar arrays, has been realigned earlier in the assembly sequence and will provide additional power for scientific activities and station assembly.

- Launch date options for the European Space Agency's Columbus Orbital Facility remain under evaluation. While these options are analyzed, the launch dates for all

flights after Utilization Flight 5 in June 2002 will remain under review; however, the U.S. Habitat Module will be fully outfitted by December 2002 regardless of the options chosen. These dates are expected to be set at a Space Station Control Board meeting in the fall of 1997.

A fact sheet on the new assembly sequence, graphics and other updated information on the International Space Station is available on the Internet in a preview of a new web site under development at: <http://station.nasa.gov> The assembly sequence itself is available at: <http://station.nasa.gov/station/assembly/chron.html>

Hubble's upgrades show stellar birth, death, details on black holes

Three months after an orbital house call by astronauts, new instruments on the Hubble Space Telescope are helping astronomers probe the universe in greater detail.

New data released by NASA this month include direct evidence of a supermassive black hole and remarkable new details on the explosive life cycle of stars. NASA also reported that all new Hubble instruments and upgrades are generally performing well.

"We're extremely excited about the quality and precision of the images from Hubble," said Wes Huntress, NASA associate administrator for Space Science. "Following check-out of the instruments, Hubble will return to full science operations, and we can expect a continuing flow of new and exciting discoveries."

These initial results clearly demonstrate the ability of the new instruments to fulfill their science goals with the Hubble Telescope, say project astronomers. Project officials said other instruments and electronics installed during the second servicing mission are generally performing well.

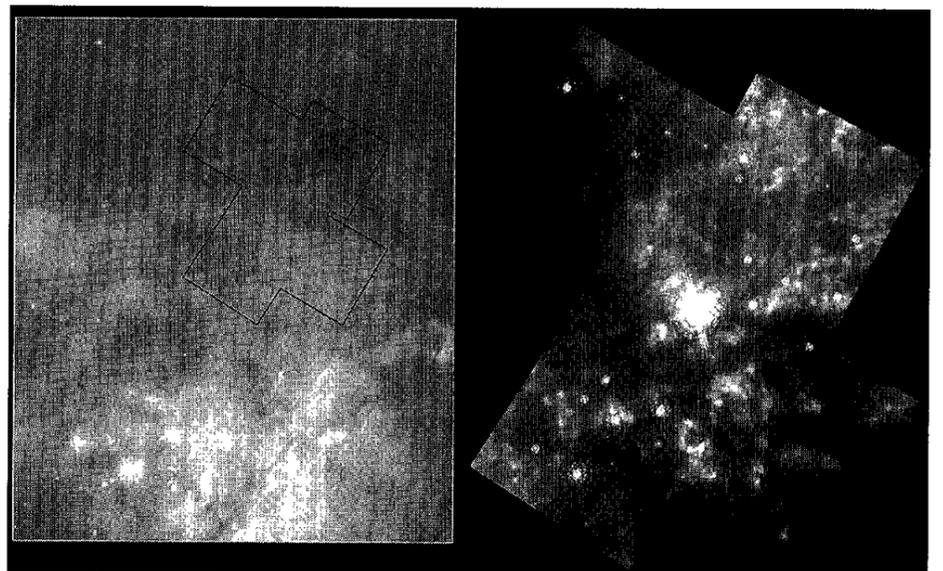
Among Hubble's recent observations:

- Jets and Gaseous Disk Around the Egg Nebula—A new infrared instrument peered deep into the region around a dying star in the Egg nebula, 3,000 light years from Earth. The new images provide a clear view of a twin pair of narrow bullet-shaped "jets" of gas and dust blasted into space. The Near Infrared Camera

and Multi-Object Spectrometer also revealed an unusual scalloped edge along a doughnut-shaped molecular hydrogen cloud.

- Unveiling Violent Starbirth in the Orion Nebula—The new infrared instrument penetrated the shroud of dust along the back wall of the Orion nebula, located in the "sword" of the constellation Orion. Data revealed what can happen to a stellar neighborhood when massive young stars begin to violently eject material into the surrounding molecular cloud. Hubble reveals a surprising array of complex structures, including clumps, bubbles, and knots of material. Most remarkable are "bullets" composed of molecular hydrogen—the fastest of which travels at more than one million miles an hour. These bullets are colliding with slower-moving material, creating bow shocks, like a speedboat racing across water.

- Monster Black Hole in Galaxy M84—In a single exposure, a new powerful instrument called the Space Telescope Imaging Spectrograph discovered a black hole at least 300 million times the mass of the Sun. The spectrograph made a precise observation along a narrow slit across the center of galaxy M84, located 50 million light-years away. This allowed the instrument to measure the increasing velocity of a disk of gas orbiting the black hole. To scientists, this represents the signature of a black hole, among the most



NASA Photo
This infrared vision from the Hubble Space Telescope's Near Infrared Camera and Multi-Object Spectrometer is providing a dramatic new look at the Orion Nebula which contains the nearest nursery for massive stars. For comparison, Hubble's Wide Field and Planetary Camera 2 image on the left shows a large part of the nebula as it appears in visible light. The new infrared vision reveals an active star birth region.

direct evidence obtained to date.

- Composition and Structure of the Ring Around Supernova 1987A—The new spectrograph also provides an unprecedented look at a unique and complex structure in the universe—a light-year-wide ring of glowing gas around Supernova 1987A, the closest supernova explosion in 400 years. The spectro-

graph dissects the ring's light to tell scientists which elements are in the ring and helps paint a picture of the physics and stellar processes which created the ring.

NASA officials report that other upgrades to Hubble are performing well, including the newly installed solid state recorder, fine guidance sensor and solar array drive electronics.

Community News

Joint JSC team travels to Disney for robot competition

A thermal overload of circuit breakers brought "Team Integral's" dreams of winning a national competition to a grinding halt last month but volunteers said they are ready to tackle the challenge again next year.

After four months of intense building, strategy and practice meetings, Integral—a team of JSC engineers and Clear Creek Independent School District high school students—traveled to Walt Disney World's Epcot Center in Florida along with 11 other NASA teams from around the agency to compete against more than 100 other teams for the Inspiration and Recognition of Science and Technology, or FIRST, national robot competition.

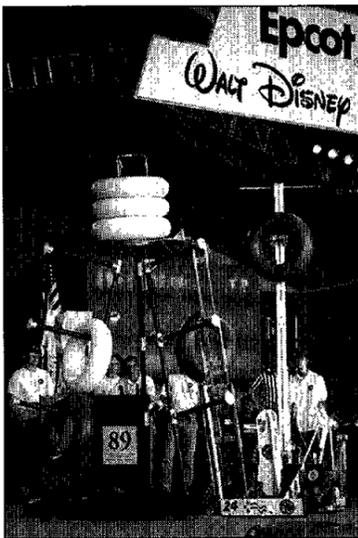
The Integral robot proved worthy of a top quarterly seeding position, but was defeated during the intense double elimination competition due to thermal overload in its circuit breakers.

"Integral's primary strategy was to 'control the top' of the goal by latching a 'shield' on the top of the goal to eliminate the high leverage scores and to place a 'sword' with three tubes into a unique 'keyway' in the shield to score

on top," said Charlie Price, team lead from Engineering's Automation and Robotics Division. "The shield deployed beautifully, but getting it to the goal took longer than expected in the rough and tumble competition environment. Thus, the secondary strategy of defensive 'flippers' was used and proved to be very effective in tipping over the opponents."

Integral won two of its four seeding rounds and placed second in the other two. In one round, Integral tipped over both opponents in a period of 38 seconds. In its first tournament round, Integral won a battle at the top against one opponent, but not before the other opponent had scored in a position that proved pivotal to the outcome. The delivery of the winning tubes on the sword was foiled by a thrown tube striking the sword at the last second of play.

In the second tournament round, Integral flipped one opponent literally 'out of the ring' within 15 seconds and was close in taking out the second opponent (loaded with three tubes) within the next 5 seconds. However, the second opponent slipped off the flipper, and speedily got to the goal, latched the



Photos courtesy of Clear Creek Independent School District

Left: Team Integral competes against more than 100 other teams for the Inspiration and Recognition of Science and Technology, or FIRST, national robot competition at Walt Disney World's Epcot Center in Florida. The JSC team spent more than four months preparing to compete in the national event. Above: Team Integral was a cooperative effort between JSC engineers and Clear Creek Independent School District high school students and teachers.

three tubes on the top, and hung on. The round ended with Integral raising the opponent's base and pulling hard, trying to dislodge it and the tubes.

The tournament was won by the Beatty Machine and Manufacturing and Hammond High School of Hammond, Ind., in a best of three series against Delphi Interior and Lighting and Pontiac Central High School of Troy, Mich. Both teams used 'swords' loaded with tubes (by a student player) to score at the top of the goal. Delphi forced a 'waiting game' by blocking out Beatty from its student player station until the last half of the match, then making a break for its own student sta-

tion. Beatty's quickness prevailed.

Out of the 11 NASA teams entered in the competition, only Ames Research Center and its partner Henry M. Gunn High School went home with an award. The team won the Autodesk Animation Award.

All participants—students from Clear Brook, Clear Creek, and Clear Lake high schools, teachers, administrators and engineers—learned a lot from this activity. All agreed that it was worth the effort, and want to do it again next year. Advocacy for additional teams from Houston for the 1998 competition began this week with a debrief to regional school district superintendents.



Boy Scout Troop 609 participates and eventually wins the tug-o-war event during their Camp-o-Ree at JSC's pecan grove. From left are Tyler Collins, Martin Bryant, Mike Whitten and Paul L. Irns.

Photo by Wendy Reid

Boy Scouts endure rain for JSC camp out

More than 230 scouts and scout leaders endured the rain and the mud during the Challenger District, Bay Area Council Camp-o-Ree held recently in JSC's pecan grove.

The Boy Scouts camped out over the weekend and participated in team/scout skill competition. Some of the scout skills included first aid, knot tying, plant identification, cooking, and map and compass skills. These scout skills were judged not only on the completion of the task, but on organization, teamwork, leadership and scouting spirit. The Boy Scouts teach all of these skills plus good citizenship and values using the camping program to make it all fun.

Camp Coordinator Mark Fridye of the Mission Operations Directorate and worked with Judy Rosen, Challenger district committee member, to organize the weekend of scouting activities.

"This event took many weeks of preparation and would not have been possible without help from many JSC organizations," Fridye said. "JSC employees in Public Affairs, the fire department, Security and Center Operations all assisted in providing the necessary resources for the Boy Scouts."

While the weather did not cooperate, it did not put a damper on the fun that all the boys had, especially in the tug-o-war event. The event leaders said they appreciated all the help that was provided to make the weekend a memorable experience for the 165 youth scouts who participated. This was the second year that the Challenger District has held its Camp-o-Ree at JSC. The district is comprised of local troops within the Friendswood, League City and Santa Fe areas. A visiting troop from Corpus Christi also participated in this year's activities.

Several JSC employees and contractors are scout leaders and helped out during the two-day event. Scout leaders from Mission Operations included Craig Oliver, Robert Alexander, Eric Redding, Stacey Hale, Scott Christiansen, Ron Harris and Wayne Hale.

"This event allowed the boys to demonstrate and compete in all the skills that boy scouts learn," Hale said. "Even more important, the event allowed the boys to practice teamwork and leadership. Building boys into good citizens is the ultimate goal of the Boy Scout movement."

Winner of the best troop at the Camp-o-Ree went to Troop 609 sponsored by St. Christopher's Episcopal Church for the second year.

Boys interested in joining or leaders who would like to volunteer can contact Scott Chistiansen at 281-282-5466 for information.

JSC saves more than 10,700 trees

JSC recycling efforts continue to save trees

Since its inception in 1989, JSC's recycling efforts has done its share to save the environment, but lately undesirable items are making their way into the recyclable paper bins causing Tolman Building Maintenance, JSC's custodial services contractor, to spend extra time sorting these non-recyclable items.

"Last year, JSC recycled 631 tons of white paper, which is equivalent to saving more than 10,700 trees," said Bill Roeh, chief of Center Operations' Plant Engineering Division. "However, this success is in jeopardy unless employees are mindful of the items they are putting in the recycling bins. Non-recyclable items have to be hand-picked out of the bins, which is very labor intensive."

The items that are recyclable are: white paper (typing, writing, photocopying), white scratch paper, tabulating cards, index cards, computer printout paper and the JSC Round-up. Staples are acceptable in these

items. Some items not recyclable include: carbon paper, blueprint paper, envelopes, newspapers, etc.

"Now that the center has chosen to convert to a fixed-price maintenance contract, and since TBM's quote for services was in part based on revenues it collects from recyclable paper, it is more important than ever for JSC employees and contractors to recycle the proper items," said Cindy Ratliff, TBM's NASA monitor.

JSC's Plant Engineering Division makes it easy to recycle by providing cardboard receptacles for employees to place on or near their desk or buildings.

"If you don't have a paper recycling receptacle for your desk, please call TBM's work control, x39564, and they will provide the containers for your office or building," said Ratliff.

For more information on JSC's recycle program call Ratliff at x33208.

JSC Safety Alert

Pedestrians Beware

What Happened
 "...This is about an accident waiting to happen. Users of crosswalks probably believe the crosswalks are ABSOLUTE safety zones. They neither look right nor left, but trust the system." Quote from a recent Close Call Report.

What You Can Do
 Take responsibility for your own safety at all times, especially when crossing a street. If you surrender responsibility to someone else, you are putting yourself at risk. Security patrols are not always around and drivers may be distracted by many things. Only YOU can make a difference.

Follow JSC pedestrian rules for crosswalks
 Obey all traffic and pedestrian control signs and signals; cross a street ONLY at a crosswalk or intersection; watch for oncoming traffic in both directions before you cross a street; wait on the curb, not in the street, until it is safe to enter a crosswalk; make sure a vehicle has enough room to stop before you step in front of it; make eye contact; keep to the right when crossing; remember, emergency vehicles ALWAYS have the right-of-way; be considerate of Space Center Houston trams and their passengers; and keep in mind that trams take longer to stop than a car.

What Is Being Done
 Security will send a letter to the supervisor of any driver who almost hits a pedestrian if: The license plate number is turned in on a Close Call report. The license number can be traced by Security to someone who works on site. When security officers observe drivers who fail to yield or stop for pedestrians, a traffic citation will be issued to the driver. The driver will be assessed 5 points, and a copy of the citation will be forwarded to the driver's immediate supervisor.

One year ago, an intrepid team of JSC workers set out on a voyage of discovery that culminates next month with the grand opening of the Earth's newest pyramid. With a multitude of ideas and free rein to use all the creativity they could muster, the small band laid the foundation for what would become a feature attraction in Moody Garden's new...



DISCOVERY PYRAMID

By Kelly Humphries

When JSC employees take advantage of their two-for-one tickets to the new Discovery Pyramid at Moody Gardens next weekend, they'll be experiencing concepts and ideas that were built by their coworkers, block by block.

At times, as many as 150 to 200 JSC workers were involved in the development of the "edutainment" complex, designed to share why NASA and JSC are doing the things they are doing with the 700,000 to 1 million visitors expected each year.

"This has just been a tremendous effort when you think about the time frame of the project," said Wayne Ordway, a systems integration manager in the Space Shuttle Program Office who was part of the original concept development team and shouldered much of the responsibility for the implementation effort. "We started this on June 4, 1996, and it is going to open June 7, so in almost exactly one year this has gone from an idea to a completed exhibit. It has been an extraordinary team effort across the entire JSC community, Moody Gardens community and Southwest Museum Services."

Southwest Museum Services is the Houston-based contractor selected by Moody Gardens to build the exhibits from the conceptual framework developed at JSC. Southwest is now working to complete fabrication and installation of the exhibits to support a June 7 public grand opening.

The first-floor attraction of the new pyramid will be an IMAX Ridefilm Theatre, which will be premiering "Asteroid Adventure." Much like the "Back to the Future" ride at the Universal Studios theme parks, the theater will use three wrap-around IMAX screens and motion-based platforms to provide the sights, sounds and movement of a space flight adventure.

The second floor will house the human space flight exhibits developed in consultation with the JSC team, which have been built around the futuristic theme of "Living in the Stars."

The first thing visitors will do is pass through a "time wall" entry way that sets the stage for thinking about the future of space flight by presenting historic imagery of science and technology from the Renaissance through Sputnik.

Once acclimated, they will enter a central area featuring a three- to 10-minute-long full-motion, hologram-like movie that will present historical figures such as Leonardo Da Vinci and Albert Einstein explaining discoveries that have made human space exploration possible and hinting at what may be yet to come.

On the visitors' left will be the "Living in Space" area that shows the unique challenges posed by the space environment. This area also will include a space habitat mock-up that showcases life sciences activities at JSC.

Nearby will be a Mission Control mock-up, provided by United Space Alliance, which shows the kind of ground support required for successful space flights.

Next, a cross-fade mural will pick up where the time wall left off at the dawn of the modern space age, highlighting the accomplishments of NASA. The multimedia presentation of video and slide imagery will be comple-

mented by an audio soundtrack.

From the mural, visitors will proceed on to the "Space Travel" area that explains how space transportation works, and the "Destinations" area that is designed to excite visitors about the promise of the future and relate the agency's vision of the future of space flight and interplanetary travel. It will focus on the exciting challenges of long-duration space flight, in particular human flights back to the Moon, on to Mars and beyond.

The final exhibit will be called "NASA-The Future..." This JSC-prepared exhibit will feature a video and surround sound presentation that integrates all of the other exhibits. Included in this exhibit will be interactive kiosks and an Internet access terminal with links to a variety of NASA web sites designed to pique visitors' interest in doing more research on their own from home. "We want to communicate to the public NASA's ambitious vision for the future and how our activities today are laying the foundation for that future," Ordway said.

Although the NASA-specific exhibit will premiere at Moody Gardens, JSC plans to make it a central element in its traveling exhibits program that can be used in many other venues in the future, Ordway said.

"Our goal is to have them come away with an understanding of why we're doing the things we're doing," said Deputy Human Resources Director Greg Hayes, who has been a prime point of contact for cooperative activities with Moody Gardens—including the recent highly successful NASA display at Baybrook Mall. "Why do we have a space shuttle? Why do we have a space station program? Why are we worried about life sciences issues? How can we fit those together to help us go off and do human exploration that we all want to do in the future?"

The "gem" on display in the NASA-The Future area will be a large, rotating half globe of Mars' northern hemisphere lighted from the inside. The half globe was fabricated in JSC's Bldg. 9 model shop by Bill Carson and John Muro, who blew the bubble out of 1/4-inch Plexiglass and used clear epoxy to add craters and other distinctive Martian features. The globe took about a month to build and, although not entirely accurate, was based on actual photographs of the Red Planet.

"We had a great set of teamwork exhibited by our people," said Frank Hughes, chief of the Mission Operations Directorate's Space Flight Training Division, who led the initial concept development phase of the project, "and the best thing that comes out of JSC all the time is innovation - so many great ideas, far more than Moody Gardens can afford to build."

The whole project began a year ago when the Moody Foundation approached JSC Director George Abbey with the idea of collaborating on the next phase of its expansion program. Abbey's associate director for management, Sue Garman, gathered 50 JSC workers from virtually every center organization and challenged them to come up with ideas. The group was broken into five separate teams and each team developed its own set of ideas independently.

"It was an excellent strategy because it placed the five teams in a friendly competition to come up with ideas," Ordway said. "We all put together briefings that summarized the best of each group's concepts. At this point, there were no constraints. Nobody knew about the Discovery Pyramid. There was no definition as to how many or how few Moody Gardens facilities we could use. The job at hand was to conceptualize what could be accomplished within the framework of a cooperative partnership. It was that open. As you might imagine, we ended up with a wide assortment of creative and interesting ideas."

The five teams' proposals had much in common from a conceptual standpoint, although there were many different approaches for communicating the variety of JSC activities that support human space flight. After each group's ideas were discussed, a proposal was prepared that highlighted the most promising of the many ideas.

After the JSC proposal had been reviewed, adjusted and approved by the center director, the team presented its ideas to the Moody Gardens staff. They took a week or two to review the proposal, then in September said they would like to pursue a partnership based on the JSC ideas and using JSC as expert consultants.

With this commitment, Moody Gardens designated the new Discovery Pyramid as the venue for the cooperative alliance.

A smaller JSC team was organized to assist with the next phase of the consulting effort. Engineers, scientists and space operations experts who formed the team first had to get a feel for what they were trying to accomplish.

"The first thing we did was, we peeled off a few of them as representatives and sent them to other museums to learn how it gets done and what makes a good exhibit," Hughes said. "Most museums would love to have this kind of committee working for them."

Next, the JSC team focused on preparing a conceptual design for the second floor exhibits. "What we really did was synthesize the best and brightest ideas from the original 50 team members into a practical floor plan with specific exhibit designs that could be accommodated within a 6,000 square foot area, which is basically what we had to work with on the second floor of the Discovery Pyramid," Ordway said. "Ultimately, we found that we could best showcase a broad sampling of JSC's human space flight activities by consolidating specific exhibit ideas within the theme areas of discover our universe, discover ourselves in space, discover space travel and discover future worlds."

Southwest Museum Services was signed on as the contractor in October. By the end of the year, a basic floor plan built around the major theme areas created at JSC was in place. The contractor emphasized entertainment, while the JSC consultants continued to press for educational value and interaction.

"In the end I think we've struck a reasonable balance between the educational and interactive elements of the exhibits, and the entertainment value of the exhibits," Ordway

said. "Southwest has really done an excellent job in capturing the essence of what we proposed in our conceptual design and then making that entertaining and interesting to the public at large."

Construction began after a final design review in February, and installation of the exhibits began early this month. JSC's most valuable contribution has been in giving Southwest a tremendous headstart with the exhibit plan and providing timely consulting expertise from across the center to assist with development of the many exhibits. "We've basically enabled Southwest to hit the ground running which was critical, given the ambitious exhibit design and fabrication schedule," Ordway said.

"When it opens on June 7, it is going to blow everybody away," said Mike Riley, executive director of Moody Gardens. "We can't say enough about how valuable NASA's expertise and assistance have been on this project. From offering the creative ideas for the exhibits to assisting in the actual design, the folks at Johnson Space Center have played a key role in the development of this next phase of Moody Gardens."

Hayes said the cooperative effort is in tune with JSC's need to tell the story of human space flight in as many different places and ways as possible. The effort spotlights the fact that at JSC, it is everyone's job to help explain to the public what NASA is doing and why.

"This demonstrates once again how effective we can be at communicating NASA's mission and JSC's reason for being if we work together and with the greater Houston community to tell the story of human space flight," Hayes said. "Every one of us has a responsibility, in one way or another, to help spread the message of how important our work is."

That type of cooperation, both internally at JSC, and externally has been a hallmark of the Moody Gardens activity, all agreed.

"This entire project has been an example of outstanding community collaboration and teamwork," Ordway said. "Everyone involved at JSC has felt a sense of ownership in this project and went beyond their normal job responsibilities to make it a success. It was really just a group of talented people committing their time and effort in a very motivated way."

"I think it worked extremely well," Hayes added. "The folks at Moody Gardens are very much interested in helping us get the story out about the space program. They think it fits well with their charter to educate the public. They are hungry for our knowledge and expertise and we are always looking for another outlet and venue to tell our story."

Hayes, Hughes and Ordway emphasized that the Moody Gardens effort is designed to augment, not eclipse the activities of Space Center Houston, JSC's official visitor center. Indeed, the activity has opened a whole new realm of cooperative possibilities between the two major tourist attractions, such as offering each other's tickets.

"What we're going to find is a real sisterhood between Space Center Houston and Moody Gardens," Hughes predicted. "It is not going to be one eclipses the other, they're going to find a way to work really closely together and make our presence in the community even bigger." □



NASA Days at Moody Gardens offer chance to avoid crowds

Moody Gardens' new Discovery Pyramid will open to the public June 7, but civil service and contractor workers will get an opportunity for a "sneak preview" May 29-31.

The coupon at right, redeemable at Moody Gardens ticket outlets, will allow employees and their families to visit two attractions for the price of one during NASA Days at Moody Gardens. The coupons will be good through Dec. 1, but the NASA weekend will be the only opportunity to avoid the public crowds as well.

JSC employees also are invited to attend the grand opening ceremonies for the Discovery Pyramid from 10 a.m.-6 p.m. Saturday, June 7.

Among the special attractions that day will be a chance to meet the Astronaut Candidate Class of 1996 from 1-3 p.m. and win a drawing for an astronaut-autographed souvenir, a special tour of JSC facilities and items supplied by United Space Alliance.

There will be NASA technology demonstrations and exhibits inside the Moody Gardens Visitor Center Garden Lobby, plus a one-sixth scale inflatable model of a space shuttle and a scale rocket engine firing demonstration provided courtesy of NASA's Stennis Space Center.

NASA engineers will demonstrate how

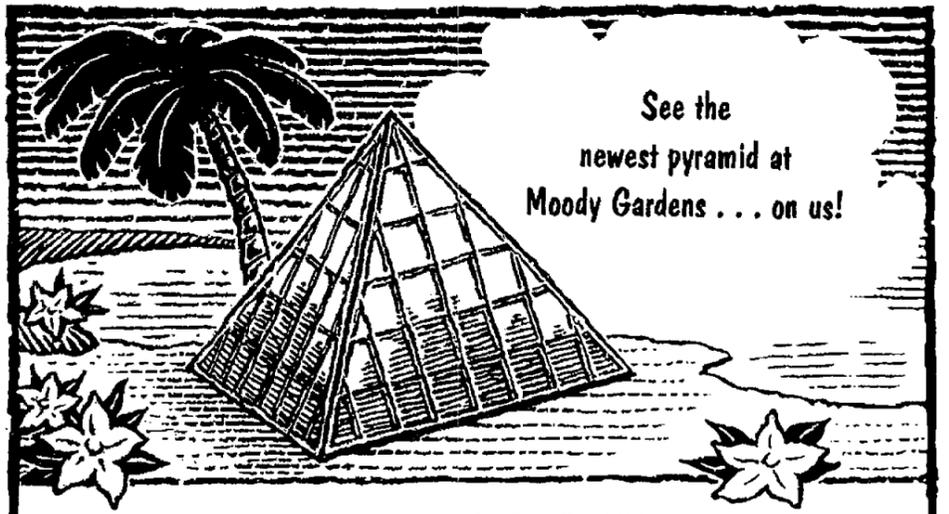
astronauts dress for space walks, how lap-top trainers can be deployed in the field, and how robot technology is being used in space exploration. Scientists will explain the recent discovery of possible ancient life on Mars and the goals of the upcoming space shuttle Neurolab mission.

Musical entertainment will be provided by members of the Southern Cross and Los Alamos bands and Marshall Space Flight Center's Tina Swindell.

In addition, several JSC employee clubs will provide demonstrations and exhibits of model rocketry, model airplanes and astronomy. As the skies darken, the astronomy groups will point their telescopes toward the heavens and offer visitors a chance to glimpse the stars.

Moody Gardens will feature a team of professional kite flyers who will raise a variety of kites over Oleander Bowl.

In addition, there will be space games for children from 11 a.m.-5 p.m. They'll include a moonwalk, shooting stars bean bag toss, face painting and an arts and crafts area where children will be invited to build a "Universe in a Bottle." Throughout the day, the Moody Gardens animal therapy department will bring out animals for children to see and, in some cases, touch.



See the
newest pyramid at
Moody Gardens . . . on us!

Get a free ticket to our new "Living in the Stars" exhibit when you purchase a ticket to either the IMAX Ridefilm "Asteroid Adventure" or to our IMAX 3D Theater. Present this coupon at the Moody Gardens Discovery Pyramid ticket counter. *One coupon admits up to six adults, seniors or children.*

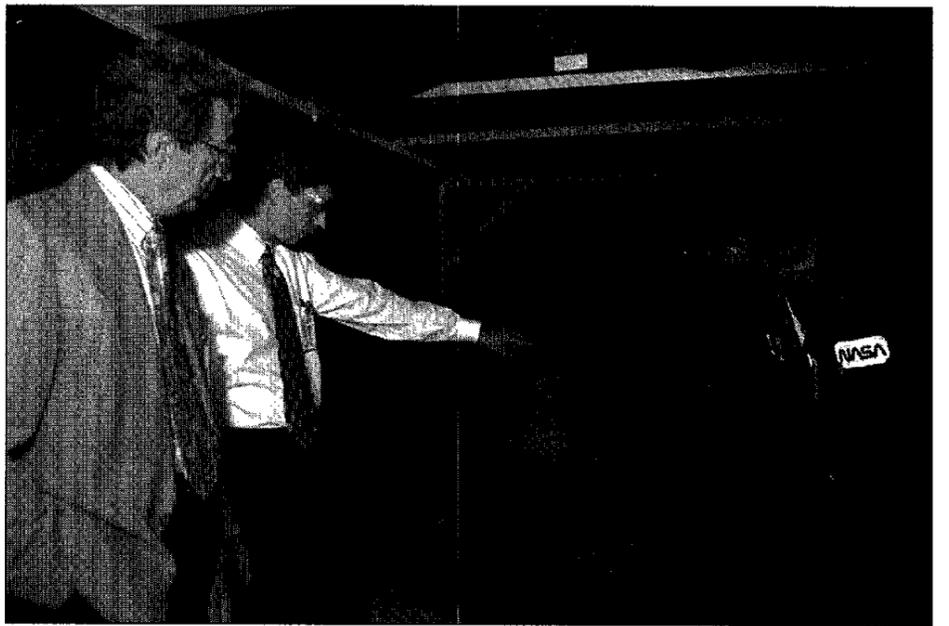
(Offer expires 12/1/97) 5/97/JSC

Clip and save coupon



Photo 97E01233 by Mark Sowa

Members of the JSC consulting team review the final plan for second floor exhibits in the new Moody Gardens Discovery Pyramid, which can be seen in the background. From left are David Krenek, Wayne Ordway, Bob Luke, Al Kelly, Louis Parker, Helen Lane, Lynn Buquo, Frank Hughes and Juan Galvez. The Discovery Pyramid will feature an IMAX ride film on the first floor, and 6,000 square feet of exhibits on the second floor that were designed by Southwest Museum Services with expert consultation from the JSC team.



JSC Photo S97-06336 by Steve Candler

Above: Bill Carson, right, shows special features of a rotating Mars half globe to Frank Hughes, far left, and Wayne Ordway in JSC's Bldg. 9 model shop. Carson and John Muro blew the bubble out of 1/4-inch Plexiglass and used clear epoxy to add craters and other distinctive Martian features. The burnt orange globe, which will be lighted from the inside, will be one of the attractions of the upstairs exhibit area. Left: The pyramid under construction.

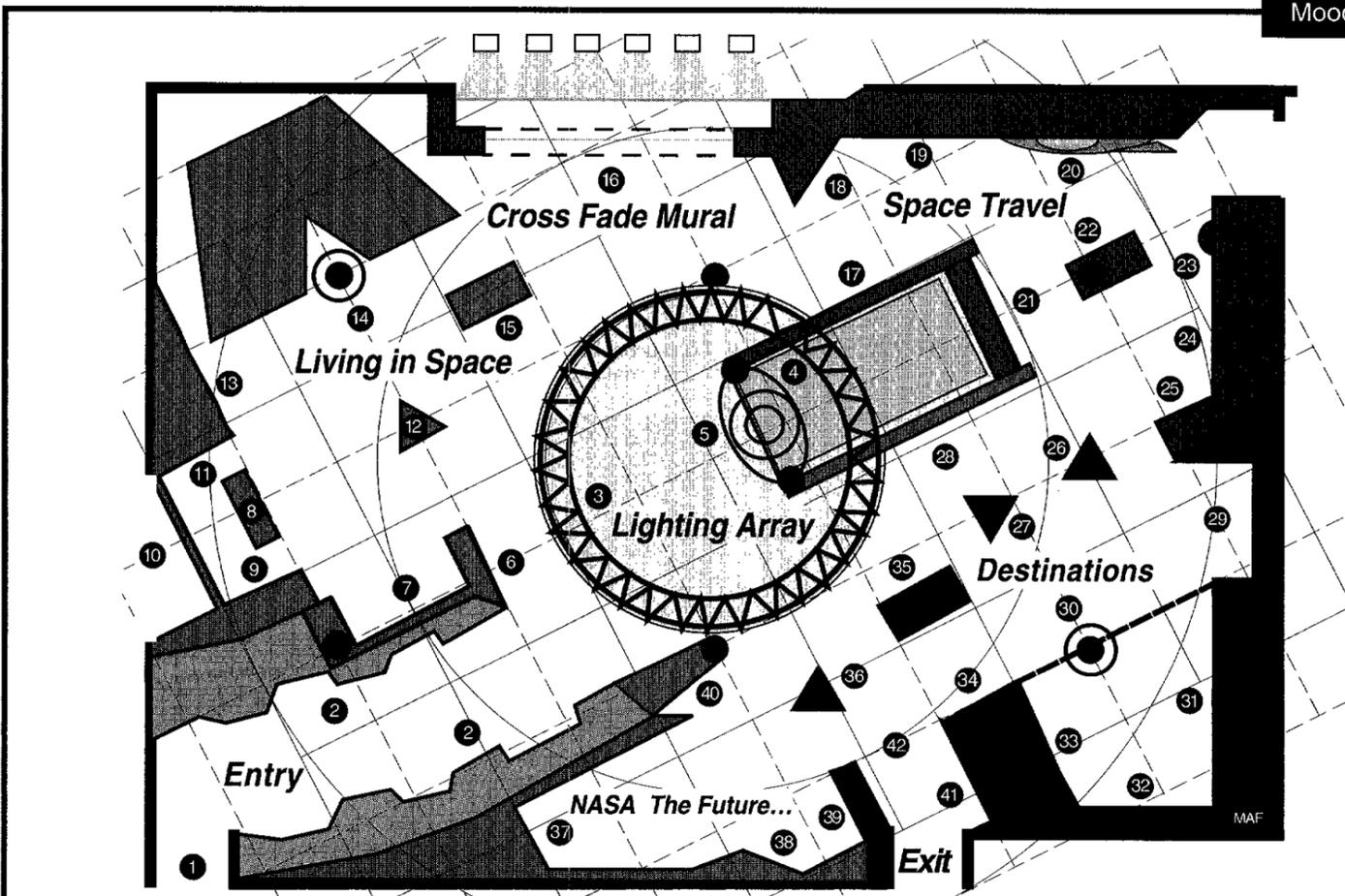


JSC Photo by Wayne Ordway

Moody Gardens Discovery Pyramid

Exhibit Features

- 1 entry arch
- 2 interactive timewall
- 3 lighting array
- 4 pulse generator
- 5 Leonardo da Vinci projection
- 6 future as history
- 7 you are the astronaut
- 8 USA-mission control
- 9 USA-images of mission control
- 10 USA-backlit mission tracking display
- 11 USA-images of mission control
- 12 science fact or science fiction?
- 13 our future address: the space station
- 14 space habitat
- 15 work stations
- 16 cross fade mural
- 17 time is relative
- 18 interactive Q&A-reaching for the stars
- 19 space vehicles
- 20 interactive x-38 mock up
- 21 interactive cd rom-packing for a mission
- 22 interactive Q&A-our sensitive earth
- 23 interactive-what would an alien look like?
- 24 how big is the universe?
- 25 interactive-voids in space
- 26 interactv-life in the universe-Miller Urey experiment
- 27 interactive-planetary orbit
- 28 the big bang
- 29 moon rocks/mars meteorite
- 30 images of Mars
- 31 interactive-Mars mission
- 32 our astronomers
- 33 a spectrum of waves
- 34 interactive-hubble telescope exhibit
- 35 hands-on interactive-space materials
- 36 artifact display
- 37 NASA-video projection-future plans
- 38 NASA-video kiosk-future plans
- 39 NASA-video kiosk-future plans
- 40 NASA-Internet kiosk
- 41 donor wall
- 42 exit arch



Floor Plan

SOUTHWEST MUSEUM SERVICES

15'

24 Years Ago at JSC



Above: The Skylab crew discusses the various methods of deploying a sunshield to shade the Orbital Workshop from the Sun. The problem was caused by the loss of the micrometeorite protective shield shortly after the Skylab I launch on May 14, 1973. Right: A sail-like sunshade for possible use as a sunshield for the Skylab Orbital Workshop is being fabricated in the GE building across the street from JSC. The material is being fed through the sewing machine. Working on the sunshade from left are Dale Gentry of GE, JSC's Elizabeth Gauldin, Alyene Baker of GE and JSC's James Barnett.

JSC Photos



Skylab II mission set to lift off from Florida

(Reprinted from the Space News Roundup May 25, 1973)

The first manned Skylab mission is scheduled to get underway at 8 a.m. today.

The mission plan calls for liftoff, followed by rendezvous, soft docking for a meal and a possible standup space walk.

The launching of Skylab 2, originally scheduled for May 15, was delayed because a micrometeorite shield was ripped off during last Monday's launch of the Skylab unmanned station. This mishap damaged the Orbital Workshop solar cell array and reduced by about half the amount of electrical power available to the space station.

Mission controllers felt that with the solar panels not operating properly, the mission could be carried out for the full 28 days, but with a reduced schedule during the latter part of the mission.

The micrometeorite shield also provided thermal protection for the Orbital Workshop; its loss caused serious heating problems.

Numerous options were considered in attempts to solve the crippled space station's heating problems. One method involved scientific airlock deployment; the other, an Extravehicular Activity from the command module.

The astronauts took off earlier this week for Marshall Space Flight Center at Huntsville, Alabama, where they went through simulations of how they would shield the space craft from the sun's rays. They left Huntsville for Cape Kennedy Tuesday night.

In a press briefing at JSC earlier this week, Life Sciences Director Richard Johnston revealed the astronauts by name who would handle the various methods of deploying the sunshield to cool the overheated workshop:

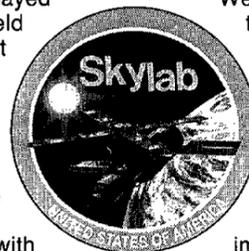
"The stand-up EVA Weitz will perform; the deployment of the Marshall sail will be Joe Kerwin, and I think the pilot, Conrad and Weitz will go down and work with the deployment of the parasol or any other airlock heat shield devices."

Flight Director Neil Hutchinson explained the EVA this way:

"The EVA is being done for a couple of reasons and I don't know which one you place more importance in, but one is to clear away any possible debris that's in the vicinity of the place we have to deploy this thing. We're not totally sure exactly how much of that meteoroid shield might be around, and of course we have to have a clean area to be able to deploy it. The other thing of course, we are still hopeful we can get solar array wing 1 out."

The high temperature within the habitation area caused some concern about possible food spoilage. Richard Johnston said Tuesday that he had tested foods that were exposed to similar high temperatures and anticipated no problems with the food on the space station.

The crew will sleep in the Command Module for at least the first two nights and is scheduled to spend Saturday morning checking the workshop for contamination.



Gilruth Center News

- Volleyball, basketball:** Registration is currently being accepted for the summer leagues.
- Softball:** Registration is under way for men's double-header softball league. Cost is \$275 per team for a six to seven week season.
- NASA Fitness Challenge:** Runs through Aug. 31. Call x30301 for more information.
- Complete Weight Control Program:** Starts June 24 with sessions on Monday, Wednesday and Friday. For more information call x30301 or x30302.
- Hatha Yoga:** A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.
- Nutrition intervention program:** A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.
- Defensive driving:** One-day course is offered once a month. Next class is June 21. Pre-registration required. Cost is \$25.
- Stamp club:** Meets at 7 p.m. every second and fourth Monday in Rm. 216.
- Weight safety:** Required courses for employees wishing to use the weight room will be offered from 8-9:30 p.m. June 12 and 26. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.
- Exercise:** Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.
- Aikido:** Martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.
- Aerobics:** Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks.
- Ballroom dancing:** Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.
- Country and western dancing:** Beginner class meets 7-8:30 p.m. Monday. Advanced class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Softball challenge turns wet for EVA groups

A challenge is a challenge and rain did not deter some JSC employees from finding out which EVA office was best at softball.

Responding to a challenge from the EVA Projects Office, Mission Operations' EVA Systems Branch and Engineering's Crew and Thermal System's EVA Branch recently slugged it out on the softball field sloshing their way through a three game challenge to determine the best softball team.

When the mud cleared, the EVA Project Office's Emu's withstood the staunch challenge from the youngsters of Mission Operations and the veterans of Engineering. The Emu's beat Mission Operations 15-1 and Engineering 12-3.

The winning team included Mary

Chesler, Chuck Franca, Milt Heflin, Robbie LaBrier, Matt Leonard, Mike Mankin, Don McMonagle, Al Morrey, Nancy Patrick, Dale Roberts and John Russo.

Mission Operations team members were Arne Aamodt, Colin Anglin, Scott Bleisath, Paul Boehm, Greg Cruse, Anna Estelle, Alan Groskreutz, George Guirgus, Kerri Knotts, Jeff Patrick, Brian Peavey, Daryl Schuck, Ed Tom and Rob Williams. Engineer's team included Ketan Chhipwadia, Susan Cupples, Scott Cupples, Dom Del-



Rosso, Frank Hernandez, Glen Lutz, Aaron Lutz, Joey Marmolejo, Hiep Nguyen, Dave Oswald, Steve Poulos, Joe Settles and Lee Willis.

The games were umpired by Calvin Schomburg of the Systems Engineering Office.

Ticket Window

- The following discount tickets are available for purchase in the Bldg. 3 and Bldg. 11 Exchange Stores. The Bldg. 3 store is open from 7 a.m.-4 p.m. and the Bldg. 11 store is open from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x37362 in Bldg. 3 or x35350 or x30990 in Bldg. 11.
- Bus trip:** June 15 to Coushatta Indian Reservation Casino. Cost is \$5.
- Belize trip:** June 22-27. Cost is \$999 per person.
- Costa Rica trip:** good through June 30. Cost is \$935 per person.
- Houston Astros Baseball:** Field box seats \$18. Astros vs. Chicago Cubs 7 p.m. June 21. Purchase tickets by June 13. Astros vs. Cleveland Indians 7 p.m. July 2. Purchase tickets by June 23.
- EAA cruises:** Seven-day cruise to Caribbean leaving from Houston in November. Prices vary depending on cabin choices. For more information call Dick McMinimy at x34037.
- Astroworld:** Early bird tickets are \$18.25 and must be used by May 31. Season pass \$56.75.
- Moody Gardens:** Tickets are \$9.50 for 2 of 4 events.
- Space Center Houston:** Adult \$8.95; children (4-11) \$6.40.
- Seaworld:** Adult \$27.25; \$18.25 children (3-11).
- Schlitterbahn:** Tickets are \$20.25 for adults, \$17.50 for children.
- Splashtown:** Early bird tickets are \$11.50.
- Movie discounts:** General Cinema, \$4.75; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.
- JSC logo shirts:** Polo style, \$23. T-shirt, \$10.
- Stamps:** Book of 20, \$6.40.
- Orbit:** The book "Orbit" by Jay Apt, Mike Helfert and Justin Wilkinson is on sale for \$28.
- Metro tickets:** Passes, books and single tickets available.



Above center: Milt Heflin of the EVA Projects Office shows the results of his slides during the EVA Softball Challenge. The EVA Project Office beat out Mission Operation's EVA Systems Branch and Engineering's Crew and Thermal Systems EVA Spacesuit Branch for bragging rights as best EVA softball team. Above: Some of the participants were, kneeling from left, Joey Marmolejo, Paul Boehm, Kerri Knotts, Anna Estelle, Ketan Chhipwadia, Milt Heflin, John Russo, Jeff Patrick and Don McMonagle. Middle row from left, Daryl Schuck, Rob Williams, George Guirgus, Scott Bleisath, Calvin Schomburg, Mike Mankin, Matt Leonard, Nancy Patrick and Robbie LaBrier. Back row from left, Dom Del Rosso, Ed Tom, Colin Anglin, Alan Groskreutz, Arne Aamodt, Brian Peavey, Chuck Franca, Al Morrey and Dale Roberts.

JSC celebrates Asian/Pacific month

May has been designated as Asian/Pacific Islander American Heritage Month to honor the heritage of a very diverse group of people.

According to the Census Bureau, a partial list of countries included in the Asian/Pacific Islander classification is China, Japan, India, Korea, Vietnam, Cambodia, Pakistan, Laos, Thailand, Tibet, Malaysia, Hawaii and the Philippines.

As of March 31, JSC employed 3,180 civil servants which included 134 Asian/Pacific Islander Americans. Of the 134 Asian/Pacific Islander Americans employees, 124 are classified as working in science and engineering, nine are in administrative positions, and one is classified as clerical.

"JSC's workforce is enriched by its diversity," said Estella Hernandez-Gillette, director of Equal Opportunity Programs. "We

will be celebrating Asian/Pacific Islander American Heritage Month on Wednesday, May 28, in the Bldg. 3 cafeteria from 11:30 a.m.-12:15 p.m. with a dance performance by Inder Trividi. The goal of having lunch time cultural events, is to give employees an opportunity to learn about the different cultures represented here at JSC."

For additional information call the Equal Opportunity Program Office at x30600.

Test subjects needed in JSC chamber

The Human Test Subject Facility at JSC is currently recruiting volunteers to participate in a hypobaric chamber test simulating extravehicular activities.

Test subjects will perform upper body exercises while sitting in a chair at altitude.

"We are looking for volunteers who are in good health and can pass the required physical exam," said Noel Skinner, lead for the

Human Test Subject Facility. "Healthy individuals between the ages of 21-50 years old who are height/and weight proportionate, are not taking any medications, have no major fractures, and no major health problems are needed. Test subjects also will be given a chest x-ray, pulmonary function and stress tests and physiological training."

Skinner said that prior to participation, a volunteer will receive a brief-

ing so he or she fully understands what the test involves. The volunteer also signs the required consent forms.

The average time involved, to prepare for and complete the chamber test, is 40 hours per volunteer and volunteers may be compensated for their time. Restrictions apply to civil service and contractor personnel.

To volunteer or for more information call Linda or Rori at x37284.

Astronaut selection process begins

By Eileen Hawley

NASA is accepting applications for mission specialist and pilot astronauts for the current selection cycle.

Interested individuals may apply until the cut-off date of July 1, 1997. Applications received after the deadline will be eligible for consideration in the next selection cycle.

Successful pilot applicants typically have extensive piloting experience in high performance jet aircraft and flight experience. Successful applicants for the mission specialist positions typically

have significant backgrounds in engineering or the sciences (materials science, earth science, medical science, and space science).

After a six-month process including screening applications and conducting interviews and medical evaluations, selections will be announced in early 1998 with the new astronaut candidates reporting to JSC in the summer of 1998.

"We are looking for individuals who not only are outstanding in their chosen field of work, but also possess the ability to get along with others and work in a diverse, multi-cultural environment," said Dave

Leestma, director of Flight Crew Operations. "We are in a very challenging and dynamic time in human space exploration and the people we choose will be an integral part of this nation's reach for the stars."

NASA accepts applications for mission specialist and pilot astronaut positions on a continuing basis.

An application package may be obtained by calling the Astronaut Selection Office at x35907, or writing to:

NASA-Johnson Space Center
Astronaut Selection Office
Mail Code AHX
Houston, TX 77058-3696

Gilruth Center spring leagues draw to close in football, volleyball

Several leagues that play at the Gilruth Center completed the spring season recently crowning champions in flag football and volleyball.

Four men's flag football teams made the playoffs from a field of 11 teams—The Greasers, Urban Guerrillas, Toad Lickers and Hangers. The first round matched the Greasers against the Hangers and the Urban Guerrillas against the Toad Lickers. The Greasers defeated the Hangers in the first game 21 to 20 which advanced them into the championship game.

In the second game, the Urban Guerrillas defeated the Toad Lickers, 19 to 7, advancing them to the finals. The Hangers and Toad Lickers played for third place. The Toad Lickers defeated the Hangers 16 to 6. In the championship, the Urban Guerrillas defeated the Greasers 27 to 18. Managers for the teams are Ken Ruta, Urban Guerrillas; Chris Madden, Greasers; Jeff Boxell, Toad Lickers and Mervin Overton, Hangers.

In the mixed flag football league, four teams made the playoffs from a

field of six teams—Blue Blaze, Flaggots, Four Plays and Don't Panic. The first round matched Blue Blaze against Don't Panic and the Flaggots against Four Plays. Blue Blaze defeated Don't Panic in the first game 13 to 0 which advanced them into the championship game.

In the second game the Flaggots defeated Four Plays 13 to 12 advancing them to the championship game. In the championship game the Flaggots defeated Blue Blaze 13 to 12. Managers for the teams are Shannan Staats,

Manager's Message

By Estella Hernandez Gillette
Director, Equal Opportunity Programs



Gillette

The JSC Equal Opportunity Programs Office has existed since the early 1970s.

For many years, the Equal Opportunity Programs Office focused primarily on assuring that the center achieved its affirmative action goals. We concentrated on providing visibility for women and minorities. Another Equal Opportunity Programs Office objective has been to resolve issues of discrimination. We have spent many hours working closely with the employees, management, Human Resources and the American Federation of Government Employees. The effort has resulted in a curtailed number of formal complaints for JSC. It behooves everyone to reach a resolution as quickly as possible. More importantly, good management practices and communication between management and the employee will keep the numbers down!

Since its inception, the Equal Opportunity Programs Office has focused on community and education outreach. Equal Opportunity Program Office staff and other JSC volunteers have spent many hours participating in career days, mentoring programs, speaking engagements and panel discussions, all in an effort to assure that tomorrow's workforce will include minorities and women, particularly in those technical areas. What we do is not for social reasons alone—it is for a practical reason that if we do not proactively participate in promoting the student's interest in science and engineering, how will we assure

a workforce from which to select when all statistics

point to a growing number of women and minorities in the workforce of tomorrow? And those groups have traditionally not made up a large portion of America's technical workforce-yet! It is not only for the good of the agency that we take an active role, but also good for the future of America's technology base.

I want to conclude my message by describing the Equal Opportunity Programs Office of today. Our philosophy is one of total inclusion, not only for minorities and women, but also for the remaining workforce.

We still focus on the regulatory objectives, but we also focus on assuring that everyone has an opportunity. Opportunities are created by the right practice. No one wants a "free ride," regardless of the person's background. Our focus today is for an appreciation of what each one of us brings to the JSC table. However, we are here first as JSC employees to meet the goals and objectives of the agency and the center, then as the person that we are. The more we do together, the more we begin to better work together. Our philosophy is that the staff will participate in anything that impacts JSC. This is how we will better get to know our customers—the JSC employees and our community!

People on the Move

Human Resources reports the following personnel changes as of April 14:

New Hires

Brenda Moulton was hired as an aerospace technician in Mission Operations.

Temporaries

Kelly Cannon and Shirley McCue joined the Space Shuttle Program.

Transfers

Donna Winchell transferred from Kennedy Space Center to the Office of the Chief Financial Officer.

Timothy Bond transferred from Kennedy Space Center to the International Space Station Program.

Reassignments

Judy Flanagan moved from the Space Shuttle Program to the Office of the Chief Financial Officer.

Pearline Collector and Roberto Galvez moved from Mission Operations to the International Space Station Program.

Promotions

Mable Cobbs was promoted to secretary in Mission Operations.

Dennis Kross was promoted to vehicle manager in the International Space Station Program Office.

Brenda Whitley was promoted to program analyst in the International Space Station Program Office.

Resignations

Janet Montoya resigned from the International Space Station Program.

Dates & Data

May 23

Blood pressure screening: The JSC clinic will offer blood pressure screenings May 23 from 8:30-9:30 a.m. at Bldg. 225; 10-11 a.m. at Bldg. 372 at Ellington Field and from 1-2 p.m. at Bldg. 17. For more information call the clinic at x34111.

Electrical fair: JSC will host an Electrical Safety Fair from 10 a.m.-2 p.m. in Bldg. 30. For details call Rindy Carmichael at x45078.

Mission viewing: The Mission Control viewing room will be open from 6-8 p.m. May 23. For the latest details on the schedule call x36765.

May 24

Mission viewing: The Mission Control viewing room will be open from 5-8 p.m. May 24.

May 28

Space medicine grand rounds: Dr. Edward Good will present "Neurologic Aspects of Space Flight," at 8:30 a.m. May 28 at the Center for Advanced Space Studies, 3600 Bay Area Boulevard. For details call Kay Nute at 244-2019.

Crew briefing: The STS-83 crew will discuss its mission at 9:30 a.m. May 28 in Teague Auditorium. For details call Helen Harris at 38413.

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 28 at the House

of Prayer Lutheran Church. For more information call Jeannette Kirinich at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. May 28 at United Space Alliance, 600 Gemini. For details call Pat Blackwell at 282-4302 or Ben Black at 282-4166.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. May 28 at the Lockheed Martin Facility, 555 Forge River Road. For more information call Richard Lehman, at 538-1854.

Astronomy seminar: The JSC Astronomy Seminar will be held at noon May 14 in Bldg. 31 Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

All hands meeting: The JSC Strategic Management All Hands meeting will be held from 2-3:30 p.m. in Teague Auditorium. Featured speakers include Frank Culbertson, Randy Brinkley and a representative of the Space and Life Sciences Directorate.

AIAA meets: The American Institute of Aeronautics and Astronautics will meet at 5 p.m. May 28 at Lake-wood Yacht Club. Astronaut Scott Altman will discuss his role as a pilot in the movie "Top Gun." For details call Danita Thomas at x32348.

May 29

Radio club meets: The JSC Amateur Radio Club will meet at 7 p.m. May 29 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For more information call Larry Dietrich at x39198.

June 3

Blood drive: JSC will host a blood drive from 7:30 a.m.-3:30 p.m. June 3 and from 8 a.m.-noon June 4 in Teague Auditorium. For details call Dan Mangieri at x33003.

ASQC meets: The Bay Area Section of the American Society for Quality Control will meet at 6 p.m. June 3 at Ramada King's Inn on NASA Road 1. Mark Madera, project engineer for the Baytown Bridge Project will discuss "The New Baytown Bridge." Dinner costs \$9 and reservations not required. For details call Ray Swindle at 335-6948.

June 4

Free concert: The Houston Symphony will perform "It's A Sounds Like Fun Circus," concert at 7:30 p.m. Wednesday, June 4 in Teague Auditorium. The free concert is open to the public and individuals are encouraged to come 30 minutes early so children can visit the "Instrument Petting Zoo," see the "Live Instrument" and visit with Ronald McDonald. For details call 587-7395.

News Briefs

Houston Symphony to perform in Teague

The Houston Symphony will perform "It's A Sounds Like Fun Circus," concert at 7:30 p.m. Wednesday, June 4, in Teague Auditorium. The free concert is open to the public and individuals are encouraged to come 30 minutes early so children can visit the "Instrument Petting Zoo," see the "Live Instrument" and visit with Ronald McDonald. For details call 587-7395.

NASA, Japan to cooperate on asteroid sample mission

NASA and Japan's Institute of Space and Astronautical Science have agreed to cooperate on the first mission to collect samples from the surface of an asteroid and return them to Earth for in-depth study. Known as MUSES-C, the mission will be launched on a Japanese M-5 launch vehicle in January 2002 from Kagoshima Space Center, Japan, toward a touchdown on the asteroid Nereus in September 2003. A NASA-provided miniature robotic rover will conduct in-situ measurements on the rocky surface.

NASA studies urban environment

Using space-age technology, NASA researchers are studying how "urban forests" may allow cities to continuously grow while maintaining air quality and the environment, as well as lower cooling costs during sweltering summer months. Collaborating with 10 Atlanta schools, NASA's Marshall Space Flight Center began a study in Atlanta this month to learn how rapid urbanization affects temperature and air quality, and what can be done to lessen the impact.

Hyakutake X-rays show way to monitor comets, solar wind

A supercomputer simulation of Comet Hyakutake's interaction with the solar wind demonstrates that resulting X-ray emissions can be used to monitor comets and solar wind phenomena. The simulation was conducted using an Earth sciences supercomputer at NASA's Goddard Space Flight Center, and results match and explain the March 27, 1996, observations of Comet Hyakutake by Germany's ROSAT satellite, the first detection of X-ray emissions from any comet. The model also supports a leading theory for how the X-rays are generated.

Thrift Savings Plan open season goes into full swing

Open season for enrolling in the Thrift Savings Plan is now under way and continues through July 31.

During open season, eligible employees may begin contributing to the plan, change the level of contributions, allocate contributions among different investment funds, terminate participation in the program or waive enrollment.

The effective date for joining the program or making a change depends upon when the election form is received by Employee Services.

Federal Employees' Retirement System employees not making contributions, may still elect to invest all or any portion of their agency automatic contributions in any of the investment funds.

JSC revises procedure for centerwide voice mail

JSC's Public Affairs Office is now the single contact point for distribution of centerwide voice mail messages.

Recognizing that centerwide voice mail is an effective means of internal communications, Sue Garman, the associate director for management, has delegated responsibility for reviewing and approving requests for posting such broadcasts to Public Affairs.

The criteria for initiating centerwide voice mail messages will be similar to the criteria for using other mass communications tools available to management, including the biweekly Space News Roundup, the Daily Space Fax Roundup, the recorded Employee Information Services telephone system and printed bulletins:

- The information to be dispensed must be of broad interest

and of general use to a wide cross section of JSC employees;

- The messages must serve a useful purpose from the perspective of top center or agency management;

- The messages will be used sparingly and only when other equally effective communications tools are not available; and

- The message to be conveyed must lend itself to a very brief,

unambiguous audio presentation.

The point of contact for centerwide voice mail requests is the Public Affairs Office's Information Services Team. Requests should be submitted by fax (244-5165) or by E-mail to Information Services Team Lead Kelly Humphries (khumphri@gp301.jsc.nasa.gov). Requests must be received several days in advance, as they must be recorded only during non-peak hours.

Robot Zoo opens Saturday; Summer camp schedule set

Space Center Houston is hosting a national unveiling of Robot Zoo, a first-time exhibit this weekend.

Robot Zoo, scheduled to be unveiled Saturday, May 24, mechanizes ordinary animals into extraordinary robot creatures, revealing nature's magic as master-planned machinery. Through entertaining, educational and interactive 3-D adventure stations, SCH guests may look at the marvel of nature through the genius of engineering.

Larger-than-life animated robots include a 9-foot-long chameleon, a 9-foot-long rhinoceros, a 6-foot giant squid with 18-foot tentacles and a 9-foot-long platypus. Also featured are a 6-foot-long house fly with a 10-foot wingspan, a 9-foot-long grasshopper, a 6-foot bat and a giraffe whose head and neck alone stretch 9 feet tall.

Space Center Houston also will host summer camps for children ages 5-14. Children can choose among nine different day camps that provide hands-on fun in an educational environment.

These camps are available:

Spacecrafts—Children ages 5-7 will have the opportunity to create crafts with a space theme. Camps will be from 8:30-11:30 a.m. and 12:30-3:30 p.m., June 30, July 2, 4, 22, 23 and 24. Cost is \$25 and includes materials and a snack.

What Planet Are You From?—Children ages 5-7 will explore the solar system through experiential

and creativity. Activities include designing a solar system and a spacesuit. Camps will be held from 8:30-11:30 a.m. and 12:30-3:30 p.m., July 1, 2, 3, 21 and 25. Cost is \$25 and includes materials and a snack.

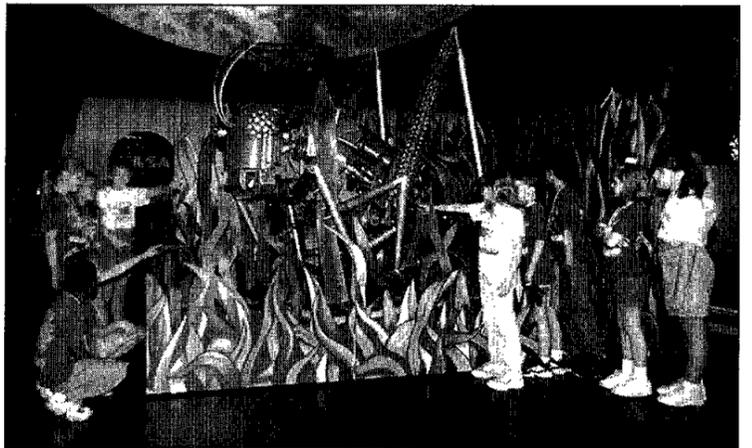
Space "U"—The University of Houston Clear lake and Space Center Houston will team up to present a full week of all-day space camps. Children ages 8-11 will design and construct model parachutes, airplanes, rocket-powered cars and space stations. There will be

opportunities to test the models, view an IMAX film and take home a book to continue to learning. Camps will be

from 8:30 a.m.-3:30 p.m. June 16-20 and July 28-Aug. 1. Cost is \$230 and includes all materials, lunch and mid-day transportation.

Mission Space Mobilization—Children ages 8-11 will become special agents on an exploration mission, designing and building an exploratory vehicle using Lego bricks. Once the vehicle is built, it will be used to explore and investigate an unknown planet. Participants will take home a Lego Hovertron to create at home. Camps will be from 8:30 a.m.-3:30 p.m. June 26, July 7, 15, 23 and Aug. 7. Cost is \$45 and includes all materials and lunch.

Rocket "Engine"-uity—Children ages 8-11 will blast off with Sir Isaac Newton and explore his three laws



JSC Photo 97E01281 by Robert Markowitz

Students from Reichter Elementary in Dayton Independent School District check out a mechanized grasshopper in the Robot Zoo.

of physics through rocketry. Children will investigate launch vehicles while building a rocket to launch at Rocket Park. Camps will be held from 8:30 a.m.-3:30 p.m. June 23, July 8, 16, 24 and Aug. 8. Cost is \$45 and includes materials and lunch.

If It Suits You—Children ages 8-11 will explore actual spacesuits of and learn how astronauts train for space walks. They will study how the vacuum of space affects the astronauts and visit with a scientist who designs spacesuits. Camps will be from 8:30 a.m.-3:30 p.m. June 25, July 11, 14, 22 and Aug. 6. Cost is \$45 and includes materials and lunch.

To the Moon and Back—Children ages 8-11 will fly to the Moon and perform crater experiments, collect data about the lunar environment and design and construct a lunar base from Lego building blocks. Camps will be from 8:30 a.m.-3:30 p.m. June 24, July 9, 17,

21 and Aug. 5. Cost is \$45 and includes all materials and lunch.

Mission to Planet Earth—Children ages 8-11 will join with NASA on a mission to save planet Earth. Participants will conduct hands-on environmental experiments and learn the role of the space program in helping the planet. Camps will be from 8:30 a.m.-3:30 p.m. July 10, 25 and Aug. 4. Cost is \$45 and includes all materials and lunch.

Aviation Adventure—Children ages 12-14 will build and launch a model space shuttle rocket, discover how the astronauts prepare for life on the International Space Station, conduct experiments related to aerospace principles, learn the importance of robotics, visit Mission Control and talk with a pilot. Camps will be from 8:30 a.m.-4:30 p.m. June 27 and July 18. Cost is \$65 and includes all materials and lunch.

For more information, call Space Center Houston at 244-2105.

Linenger to return on Atlantis after four months on Mir

(Continued from Page 1)

worked with several experiments in the Biorack system inside the Spacehab. Mission Specialist Ed Lu conducted a photo survey of the Mir station, and Russian Mission Specialist Elena Kondakova took hot and cold water samples on Mir.

Precourt said Linenger was ecstatic when *Atlantis* docked May 16 and the hatches opened at 11:25 p.m. and the 10 space workers greeted each other. Linenger was at the door as the *Atlantis* crew went on board the Russian station and he welcomed them with a quick "flying" lesson.

"He's had a really good mission and I think he's feeling a real sense of accomplishment, especially now that Mike is here," Precourt told

reporters during the flight. "Jerry and Mike are working real hard right now to get the equipment for the science stowed where it's easily accessible for Mike so he can be more efficient than Jerry was—and Jerry was pretty darned efficient—so he's got a real sense of accomplishment. He's got a lot to be proud of, and he's real happy to be coming home with us."

Precourt's counterpart, Mir 23 Commander Vasily Tsibliev, expressed satisfaction with the safety of the Russian station, which has withstood several systems problems over the past few months. Tsibliev said an onboard fire in February, caused by a faulty back-up oxygen-generating canister, almost forced an evacuation.

"We saw that we had put the fire

out and the crew was in a condition to continue its mission, so we waited for a couple of hours," Tsibliev said. "You see, I'm alive and healthy, smiling, so the condition of the station is just the same way."

Aside from some crowding because of outdated cargo, some of which will be returned to Earth aboard *Atlantis*, the station is operating normally, he said.

"Everything is very reliable," he said. "The problems that we had with the terminal control system were fully repaired so everything's working fine. It has a back-up now so we practically have no problems."

Phase 1 Program Manager Frank Culbertson said the smooth transfer work was an indicator of how well the two crews and commanders are

working together.

"What we continue to see on these missions is that when the shuttle and Mir come together, you end up with one crew that works together very well," Culbertson said. "What you are seeing is an increasing professionalism and efficiency."

Atlantis lifted off on schedule at 3:08 a.m. CDT May 15 after a smooth and uneventful countdown.

The *Atlantis* crew was to bid farewell to Foale, Tsibliev and Flight Engineer Alexander Lazutkin on May 21, and test a new European laser docking sensor as it undocks and drifts away from the Russian outpost. Landing is scheduled for Saturday, May 24. Linenger will have spent just over 132 days in space if *Atlantis* lands as scheduled.



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Editor Kelly Humphries
Managing Editor . . . Karen Schmidt

Fourth all-hands eyes Phase 1, station, future

The fourth in a series of all-hands meetings that started after NASA Deputy Administrator Jack Dailey's visit early this year will be conducted at 2 p.m. Wednesday, May 28, in Teague Auditorium.

JSC Assistant Director, Technical, Brian Duffy will moderate a panel discussion on the status of the Phase 1 and International Space Station Programs and plans for future exploration.

Phase 1 Program Manager Frank Culbertson will discuss activities, challenges and plans of the shuttle-Mir docking program. International Space Station Program Manager Randy Brinkley will address similar topics relating to the planned permanent orbiting outpost, and Space

and Life Sciences Director David Short will look at projects focused on the future, Mars meteorite research and human life sciences research.

All JSC civil service and contractor employees are invited to attend and ask questions.

The forum is designed to inform employees of key activities across the center, and to illustrate how JSC is implementing the NASA and Human Exploration and Development of Space strategic plans.

More information is on-line. The Strategic Management Handbook is at: <http://www.hq.nasa.gov/office/codez/strahand/frontpg.htm>

The NASA Strategic Plan is at: <http://www.hq.nasa.gov/office/nspl/NSPTOC.html>